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Fertility Decline in Malawi: A Decomposition Analysis

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Abstract

Fertility in Malawi has been declining since the late 1980s. Total Fertility Rate is reported to have declined by 1.1 children per woman from 5.7 in 2010 to 4.6 in 2015. This reduction indicates a continuing rapid decline in fertility in the country. In view of the foregoing, this study aims to examine the influence of the age structure of the population, nuptiality, and marital fertility on fertility in Malawi. This study used the Malawi Demographic and Health Survey data from 1992, 2000, 2004, 2010, and 2015–2016. Standardization and decomposition methods were used to re-examine fertility trends in Malawi. The results confirms that fertility is declining in Malawi and the fall is clustered among women younger than 30 years of age. The contribution of marital fertility to the decline of Total Fertility Rate was 65.0% during the period 1992–2000, 89.5% during 2000–2004, 2.6% during 2004–2010, and 4.3% during 2010–2015, respectively. Over the same period, the respective contribution of the proportion married was 29.4%, 10.8%, 77.9%, and 92.6%. These percentages suggest that marital fertility followed by proportion of married were important factors before 2005. After 2005, fertility levels and patterns in Malawi are largely influenced by nuptiality. However, there is need for further studies to explain the marriage and fertility nexus in the Malawian context.

Keywords: crude birth rate; decomposition; fertility; marital fertility; nuptiality

Introduction

Malawi is one of the countries considered to be on the rise with regard to increased uptake of family planning methods (Solo, Jacobstein, and Malema 2005). Contraceptive use has increased from 13.0% in 1992 to 24.6% in 2000, 25.5% in 2004, 45.8% in 2010 and 58.8% in 2015 (NSO and Macro 1994, 2002, 2006, 2011, 2017). Until recently, the increase in contraceptive use did not translate into noticeable fertility decline (Chintsanya 2013; Palamuleni 2013). Available statistics indicate that Total Fertility Rate (TFR) of 6.7 children per woman in 1992 declined to 6.4 children per woman in 2000, 6.0 children per woman in 2004, 5.7 children per woman in 2010 and 4.6 children per woman in 2015 (NSO and Macro, 1994, 2002, 2006, 2011, 2017).

Malawi is located in Africa, a continent known for its high fertility rates and a delayed start to the demographic transition (Cohen, 1998; Kirk and Pillet, 1998; UN, 2015; Casterline, 2017; Garenne, 2018). Numerous studies have demonstrated that fertility transition is in progress in Africa (Garenne, 2018; Caldwell and Caldwell, 1995; Caldwell, Orubuloye, and Caldwell, 1992; Machiyama, 2010; Machiyama, et.al., 2010). However, the speed, timing, pattern, determinants, and consequences of the observed fertility transition remain to be

established (Garenne and Joseph, 2002; Garenne, 2013). The commencement of fertility transition in Africa is not only welcomed but has also given rise to discussions on the nature and patterns of transition, as well as the causes and consequences for such a decline (Diamond and Rutenberg, 1995). There are researchers who questioned whether decrease in fertility in Africa was real and sustainable (Blacker, 1994; Machiyama, 2010; Machiyama, et.al., 2010).

The decline of fertility in Africa is a subject that has attracted attention among social scientists (Schoumaker, 2017; John and Adjiwanou, 2022; May and Rotenberg, 2020; Caldwell, Orubuloye, and Caldwell, 1992; Casterline, 2017; Garenne, 2018). Among the factors stated as causing the decline in fertility in sub-Saharan Africa, the rise in female employment is included (Van den Broeck and Maertens, 2015), as well as family planning programmes (Caldwell, Orubuloye, and Caldwell, 1992; Caldwell and Caldwell, 2002); urbanisation (Garenne and Joseph, 2002), female education (Behrman, 2015; Shapiro, 2012), changes in the nuptiality patterns (Gaisie, 2000; Gaisie, 2013; Shapiro and Gebreselassie, 2014), abortion (du Lou, et.al., 2000; Singh, Bankole, and Darroch, 2017). However, there are limited studies that have been conducted to understand the causes and consequences of fertility transition in Malawi.

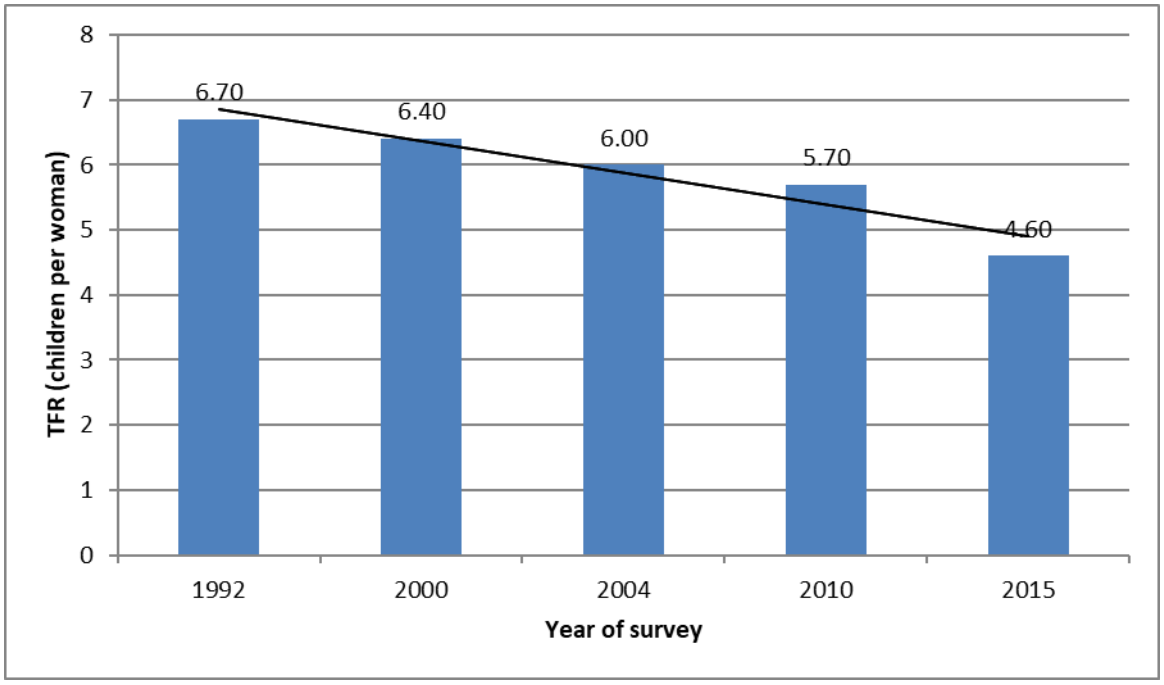
One consequence of decline in fertility that appears to dominate most of the discussions in recent decades is the issue of demographic dividend. It is believed that as fertility declines, the age-sex structure will change in such a way that there will be a time when the people in the working age groups 15–64 years will outnumber the younger age group (population younger than 15 years of age) and the older age group (population older than 65 years of age). When this happens, with the right policies in place for good governance and no corruption, economic development is expected to hasten as savings and investment opportunities increase. This observation has given rise to an increasing number of social scientists taking an interest in the decline of fertility.

This study re-examines the Malawian fertility transition using decomposition techniques to provide additional insights into other dimensions of the decline.

Studies on Fertility in Malawi

Since a complete Vital Registration System (VRS) is not available, fertility studies in Malawi have mostly relied on data collected from population censuses and demographic surveys. To date, six national population censuses (1996, 1977, 1987, 1998, 2008, 2018) and several nationally representative demographic surveys such as 1970–1972 Malawi Population Change Survey, 1982 Malawi Demographic Survey, and 1984 Family Formation Survey have been conducted. Malawi has also conducted Demographic and Health Surveys (MDHS) in 1992, 2000, 2004, 2010 and 2015. Furthermore, Malawi has carried out Multiple Indicator Cluster Surveys in 2006, 2013–2014 and 2019–2020.

The first post-colonial census in 1966 did not include questions on fertility, but researchers used indirect techniques to estimate a TFR of 6.5 for the mid-1960s (Palamuleni, 1993; Hill, 1986). Application of the Brass P/F Brass ratio technique and the Gompertz relational model to data from the 1970–1972, 1982, and 1984 surveys and 1977 census revealed that TFR remained more or less constant at 7.7 children per woman (MG 1984, 1987a, 1987b). The analysis of 1987 suggested a slight decline in TFR to 7.4 children per woman (MG 1994a). TFR was estimated to be 6.5 children per woman in 1998 and declined further to 6.0 children per woman in 2008 (MG 2013). The decline of TFR estimates, based on available MDHSs, are reflected in Figure 1.



Source: Created by the author using data from MDHSs

Figure 1. Total Fertility Rates for Malawi from 1992–2015

Although the national child spacing programme was adopted in 1982, the emphasis was on the improvement of maternal and child health. The late 1980's marked the beginning of a gradual, but significant, shift in Malawi's official approach towards birth/population control and family planning programme. The establishment of the Demographic Training Unit at the University of Malawi, with financial and technical assistance from the United Nations Population Fund (UNFPA), had the sole mandate to train population scientists to integrate population variables into development planning. Later, the Ministry of Economic Planning and Development created the Population and Human Resource Development Unit (PHRDU) whose mandate was to coordinate all population activities in Malawi. In addition, the National Family Welfare Council of Malawi (later renamed National Family Planning Council of Malawi) was established and granted the mandate to coordinate family planning and other reproductive health services in Malawi. Furthermore, the emergence of multiparty democracy saw the mushrooming of Non-Governmental Organizations (NGOs) and Community Based Organisations (CBOs) working on population issues. The changing institutional landscape led to increasing ascendency of health concerns of the high population growth rate.

Furthermore, 1994 marked another milestone in the national family planning programme in Malawi. Three events stand out during that year. First, Dr. Banda, Malawi's first president who served from 1964 to 1994 and was previously thought to view family planning as a foreign idea, approved the country's first national population policy, which included support for family planning. Second, the shift toward multiparty democracy led to a new government under Dr. Muluzi, who was president from 1994 to 2004. This era saw the establishment of various NGOs and community-based organizations focused on reproductive health. Third, Malawi took part in the International Conference on Population and Development (ICPD) in

Cairo in 1994. Following the conference, which emphasized reproductive health, the Malawian government, like many others, pledged to support and safeguard the sexual and reproductive rights of all women. Consequently, the Ministry of Health was renamed the Ministry of Health and Population (MHoP), and the Population and Health Research Development Unit (PHRDU) was moved from the Ministry of Economic Planning and Development to MHoP.

The 1990s saw development of several policies in population and reproductive health. Chief among these were the National Population Policy (MG 1994b), and the Family Planning Policy and Contraceptives Guidelines (MG 1996). The Family Planning Policy and Contraceptives Guidelines advocated that these services are available to all men and women and improved access to family planning services by removing age and marital status barriers.

The National Reproductive Health Policy adopted in 2003 detailed strategies related to the health sector reforms consistent with the ICPD, the 1995 Beijing Conference on Women, and the Millennium Development Goals.

Data and Methods

Data

The study utilized data derived from five Malawi Demographic and Health Surveys conducted in 1992, 2000, 2004, 2010, and 2015–2016 (NSO and Macro 1994, 2002, 2006, 2011, 2017). These surveys are cross-sectional, nationally representative, and have collected data of good quality that have produced reliable demographic estimates. The surveys collected information on women's socio-demographic characteristics, birth history, reproductive health, contraceptive methods, and HIV/AIDS.

Methods

Fertility levels, trends, and patterns are examined by using estimates obtained from the survey data from 1992–2015. Standardization is used to control the differences in the reported population age structure. Three decomposition methods were used to decompose Crude Birth Rate (CBR), Age Specific Fertility Rates (ASFR), and TFR into marital fertility, marital or nuptiality structure, and age composition (Arriaga, Johnson, and Jamison, 1994; Sibanda, et.al., 2003; Kouaouci, 1993; Chaurasia, 2011). These methods have been extensively used and have produced plausible results (Gubhaju, Jongstra, and Raikot,i 2014; Palamuleni, 2011; Kouaouci, 1993; Chaurasia, 2011). Moreover, there is a growing interest in fertility studies in using decomposition procedures (Gubhaju, Jongstra, and Raikoti, 2014; Palamuleni, 2011; Sibanda, et.al., 2003; Jiang et al. 2019; Yip, Chen, and Chan 2015; Sayi 2014). Some of the recent studies that have employed decomposition analyses were conducted in countries such as South Africa (Palamuleni, 2011); Nepal, Fiji (Gubhaju, Jongstra, and Raikoti, 2014), Hong Kong (Yip, Chen, and Chan, 2015), India (Chaurasia, 2011) and North Africa (Mohammed, 2024).

Decomposing CBR

The first approach used in this study is based on decomposing CBR into three components representing the marital fertility, age structure and proportion married.

$$CBR = \frac{\mathrm{B}}{\mathrm{P}}\ 1000 \quad \ldots\ldots (1)$$

where B is the number of live births in a year and P is the population at risk. This equation can be rewritten as follows.

$$CBR = {}^{\mathrm{Pf}15-49}/_{\mathrm{P}}\ x\ {}^{\mathrm{MW}15-49}/_{\mathrm{Pf}15-49}\ x\ {}^{\mathrm{B}}/_{\mathrm{MW}15-49}\ 1000 \quad \ldots\ldots (2)$$

where $P^{f}_{15\text{-}49}$ is the female population in the reproductive age groups (15–49 years), $MW_{15\text{-}49}$ is married women aged 15–49 years, and B and P are the same as defined previously. Equation (2) indicates that CBR consists of three components: the proportion of women aged 15–49 years in the total population; the proportion of married women in the age group 15–49 years and the fertility rate among married women. These three components represent the age structure, nuptiality and marital fertility, respectively.

Assuming that <S> represents the structure, <N> represents nuptiality, and <F> represents marital fertility, then the difference between two crude birth rates (CBRs) (denoted CBR_1 and CBR_2) can be presented as $CBR_1 - CBR_2$. Using logarithms rule this can be written as follows.

$$\log CBR_1 - CBR_2 = \log CBR_1/CBR_2 \quad \ldots\ldots (3)$$

$$\log (CBR_1/ CBR_2) = \log (<S_1>/<S_2>) + \log (<N_1>/<N_2>) + \log (<F_1>/<F_2>) \quad \ldots\ldots (4)$$

Dividing both sides of the equation (4) by $\log (CBR_1/CBR_2)$, the following equations are obtained.

$$\frac{\log (CBR_1/CBR_2)}{\log (CBR_1/CBR_2)} = \frac{\log (<S_1>/<S_2>)}{\log (CBR_1/CBR_2)} + \frac{\log (<N_1>/<N_2>)}{\log (CBR_1/CBR_2)} + \frac{\log (<F_1>/<F_2>)}{\log (CBR_1/CBR_2)} \quad \ldots\ldots (5)$$

Considering the right hand of equation (5), the first part represents the impact of the contribution of the age structure, the second part is the impact of nuptiality and the third part is contribution of marital fertility.

Decomposing ASFR

The second decomposition method is based on the United States Bureau of Census (Arriaga, Johnson, and Jamison 1994). The formula for decomposing fertility is presented as follows.

$$ {}_5 f_x = \frac{{}_5 B_x}{{}_5 FP_x} = \frac{{}_5 B_x}{{}_5 W_x} \cdot \frac{{}_5 W_x}{{}_5 FP_x} = {}_5 wf_x \cdot {}_5 Pw_x \quad \ldots\ldots (6)$$

where ${}_5 f_x$ is the ASFR pertaining to women aged x to x+4 years; ${}_5 B_x$ is the number of births to mothers age x to x+4 years; ${}_5 FP_x$ is the total number of women age x to x+4 years; ${}_5 W_x$ is the number of women who are mothers at age x to x+4 years; ${}_5 wf_x$ is the fertility rate of all mothers in the population

at age x to x+4 years; and ${}_5Pw_x$ is the proportion of mothers age x to x+4 years. Hence, the TFR can be expressed in terms of maternal fertility and proportion of mothers, as follows.

$$\text{TFR}=5\sum {}_5f_x = 5\,{}_5wf_x \cdot {}_5Pw_x \quad \text{……(7)}$$

where the definition of the symbols is the same as given previously.

Decomposing TFR

The third decomposition method used in this study is based on the methodology proposed by Lindstrom and Woubalem (Lindstrom and Woubalem, 2003) who demonstrated that the TFR is the weighted sums of the marital (Fxm) and nonmarital (Fxn) age-specific fertility rates where the weights are the age-specific proportions of women married (kxm) and not married (kxn).

$$\text{TFR}=5\sum_x \left(k_{xm}F_{xm} + k_{kn}F_{xn}\right) \quad \text{……(8)}$$

The difference between two TFRs can be decomposed into change in (i) the proportion married, (ii) marital fertility rates, and (iii) non-marital fertility rates. Mathematical the decomposition can be presented as follows.

$$\Delta\,\text{TFR}=5\sum_x \frac{1}{2}\left(F_{xm}^{(t_2)} + F_{xm}^{(t_1)}\right)\left(k_{xm}^{(t_2)} - k_{xm}^{(t_1)}\right) \quad \text{……(9)}$$

$$+5\sum_x \frac{1}{2}\left(F_{xn}^{(t_2)} + F_{xn}^{(t_1)}\right)\left(k_{xn}^{(t_2)} - k_{xn}^{(t_1)}\right) \quad \text{……(10)}$$

$$+5\sum_x \frac{1}{2}\left(k_{xn}^{(t_2)} + k_{xn}^{(t_1)}\right)\left(F_{xn}^{(t_2)} - F_{xn}^{(t_1)}\right) \quad \text{……(11)}$$

Results and Discussion

Table 1 presents various measures of fertility for Malawi from 1992 to 2015-2016. The values of CBR and General Fertility Rate (GFR) indicate an increase in fertility between 1992 and 2000 and a declining trend thereafter, whereas TFR reveals a fertility decline during the period under review although the decline was rather modest in the 1990s, early 2000s, and much more rapid between 2010 and 2015.

For the period 1992–2000, when the CBR increased by 6% from 42.9 to 45.5, the standardized CBR declined by 3.6% from 57.6 to 55.5. This suggests that even though fertility was declining the age-structure was influencing CBR to increase rather than decrease. For the period 2000–2004, CBR fell by 6.8% from 45.5 to 42.4. During this period, changes in the age structures contributed nearly two-thirds of the decline, whereas the remaining one-third was due to genuine decline in age-specific fertility. The same can be said for the period 2004–2010. During the period 2010–2015, CBR fell by 18% from 39.2 to 32.2 with almost all the decline ascribed to variations in the age structure.

The standardized CBRs suggest that fertility declined by 3.6%, 4.6%, 5.9%, and 23.5% between 1992–2000, 2000–2004, 2004–2010 and 2010–2015 respectively. These percentages further suggested that

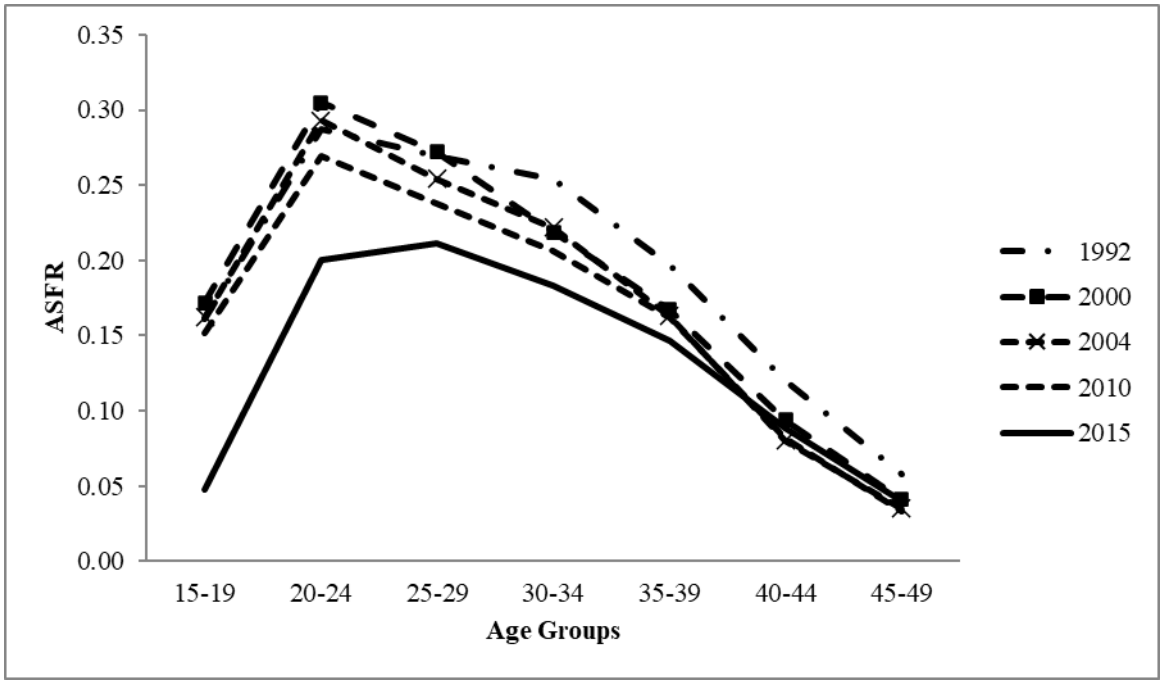
the tempo of fertility decline has increased over time.

Figure 2 indicates the age pattern of fertility in Malawi. The age-specific fertility rates (ASFRs) rise as the age of the mother increases reaching a peak in the age group 20–24 years and then decline reaching a minimal value in age group 45–49 years. All datasets show the same pattern. The observed age pattern of decline in fertility indicates that during the period 1992–2004 most of the decline occurred among women older than 35 years of age, whereas during the period 2004–2015 women younger than 35 years of age show the greatest decline in fertility.

Table 1. Selected Measures of Fertility for Malawi (1992–2015)

Age groups (years)	Year					Percentage change			
	1992	2000	2004	2010	2015	1992-2000	2000-2004	2004-2010	2010-2015
15–19	0.161	0.172	0.162	0.152	0.047	6.8	-5.8	-6.2	-68.9
20–24	0.287	0.305	0.293	0.269	0.200	6.3	-3.9	-8.2	-25.5
25–29	0.269	0.272	0.254	0.238	0.211	1.1	-6.6	-6.3	-11.1
30–34	0.254	0.219	0.222	0.206	0.183	-13.8	1.4	-7.2	-11.2
35–39	0.197	0.167	0.163	0.162	0.147	-15.2	-2.4	-0.6	-9.5
40–44	0.120	0.094	0.080	0.082	0.088	-21.7	-14.9	2.5	7.7
45–49	0.058	0.041	0.035	0.033	0.040	-29.3	-14.6	-5.7	20.0
TFR	6.7	6.4	6.0	5.7	4.6	-5.6	-4.8	-5.5	-19.7
CBR	42.9	45.5	42.4	39.2	32.2	6.1	-6.8	-7.5	-17.9
GFR	207.8	209.3	211.1	187.0	140.8	0.7	0.9	-11.4	-24.7
Standardized Rates (direct)									
CBR	57.6	55.5	53.0	49.8	38.3	-3.6	-4.6	-5.9	-23.2
GFR	204.1	196.9	187.7	176.7	135.7	-3.6	-4.6	-5.9	-23.2
Standardized Rates (indirect)									
CBR	57.5	55.9	53.7	49.5	37.7	-2.8	-3.9	-7.8	-23.8
GFR	203.6	197.8	190.0	175.2	133.6	-2.8	-3.9	-7.8	-23.8

Source: Calculated by author using data from MDHSs



Source: Created by the author using data from MDHSs

Figure 2. Age-Specific Fertility Rates (ASFR) for Malawi, 1992–2015

Decomposing Crude Birth Rate

Table 2 shows the data required for and the results of decomposing CBR into three components of age structure, nuptiality, and marital fertility. During the period 1992–2015, the proportion of married women in the population declined from 84.3% in 1992 to 83.0% in 2000 remaining at the same level in 2004 before declining to 80.3% in 2010 and 64.9% in 2015. Marital fertility increased from 0.246 in 1992 to 0.252 in 2000 and increased slightly to 0.253 in 2004 before declining to 0.233 in 2010 and 0.217 in 2015. The proportion of married women in the study population declined from 0.843 in 1992 to 0.830 in 2000 and increased to 0.835 before declining to 0.803 in 2010 and 0.649 in 2015. The proportion of women in the study population increased from 0.206 in 1992 to 0.217 in 2000 and declined to 0.201 and increased to 0.210 in 2010 and 0.229 in 2015.

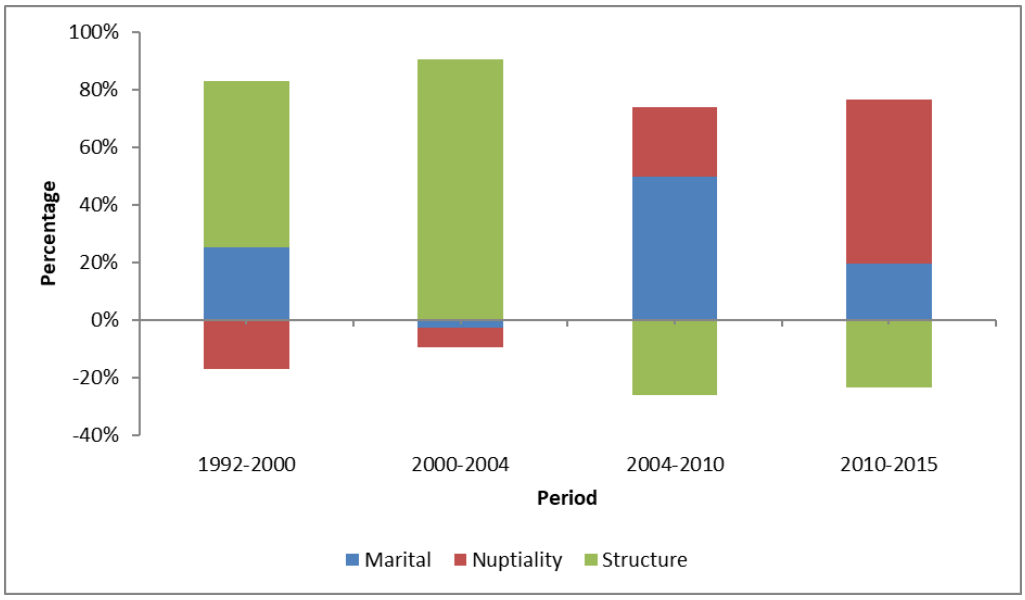
The results indicate that during the period 1992–2000, the age structure and marital structure had positive impact to the rise in fertility, whilst marital fertility had the negative influence on the change in CBR. During 2000–2004 the influence of the age structure was associated with an increase in fertility, whereas both nuptiality and marital fertility were associated with reduced fertility. In other words, the decline in CBR was due to upward pressure of changes in the age structure (112%) combined with the downward pressure of marital fertility (-3.5%) and nuptiality (-8.5%).

The decline in CBR between 2004 and 2010 was largely explained by changes in marital fertility (103.6%) and nuptiality (50.9%) combined with an upward pressure exerted by the age structure (54.5%). The period 2010–2015 was marked by a further decline in CBR. The decline was attributed to changes in nuptiality (107.7%) and marital fertility (36.7%), which was compensated by the upward pressure of the age structure (44.4%).

Table 2. Decomposition of Crude Birth Rate (CBR) for Malawi (1992–2015)

Components	**1992**	**2000**	**2004**	**2010**	**2015**
Women	4849	13219	12698	23020	24562
Births	1008	2767	2680	4305	3457
Married	4088	10978	10609	18480	15952
Population	23488	60809	63219	109811	107366
CBR	42.9	45.5	42.4	39.2	32.2
Indicators of components					
CBR/1000	0.043	0.046	0.042	0.039	0.032
birth/married	0.246	0.252	0.253	0.233	0.217
married/population	0.843	0.830	0.835	0.803	0.649
women/population	0.206	0.217	0.201	0.210	0.229
		1992–2000	**2000–2004**	**2004–2010**	**2000–2015**
Absolute Change					
Marital fertility		0.010	0.001	-0.035	-0.031
Nuptiality		-0.007	0.003	-0.017	-0.092
Age structure		0.022	-0.034	0.019	0.038
Overall		0.026	-0.031	-0.034	-0.085
Percentage Change					
Marital fertility		38.0	-3.5	103.6	36.7
Nuptiality		-25.8	-8.5	50.9	107.7
Age structure		87.8	112.1	-54.5	-44.4
Overall		100.0	100.0	100.0	100.0

Source: Created by the author using data from MDHSs



Source: Created by the author using data from MDHSs

Figure 3. Contribution of Marital Fertility, Nuptiality, and Age Structure to Differences in Crude Birth Rates (CBR) for Malawi (1992–2015)

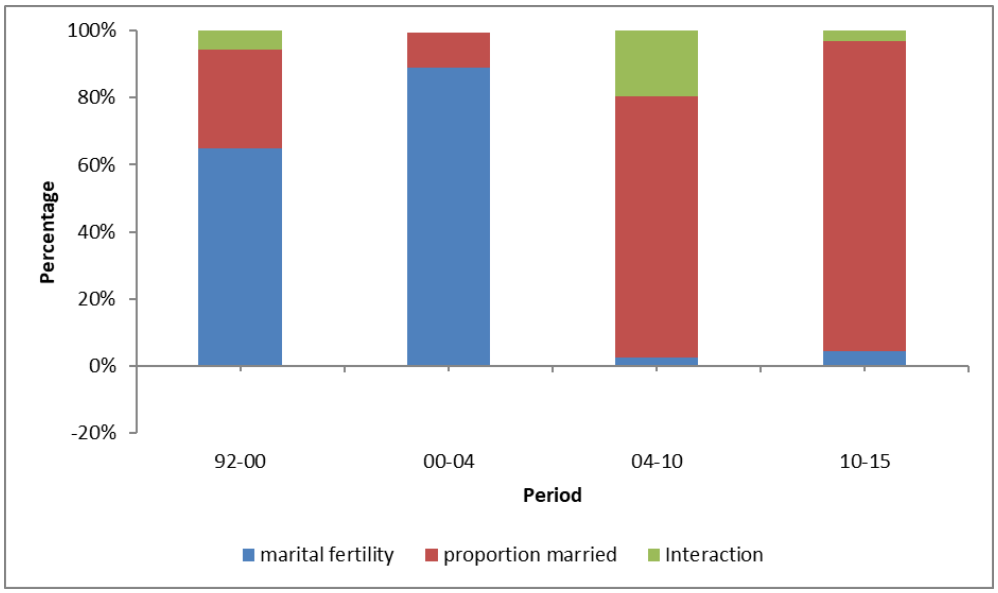
Decomposing ASFR

Table 3 and Figure 4 presents the outcomes of the US Census Bureau decomposition method using MDHS data. Table 3 indicates that the change in TFR between 1992 and 2000 consists of variations in marital fertility (65.01%), proportion married (29.4%), and interaction (5.5%). During the period 2000–2004, 89.9% was due to marital fertility, 10.8% because of proportion married and the interaction factor increased fertility by 0.5%. After 2004, the changes in nuptiality were the main issue contributing to the fall in fertility. This was followed by marital fertility. In this respect, between 2004 and 2010, the proportion married contributed 77.85%, whereas marital fertility contributed 2.62%. Similar percentages for the period 2010–2015 were 92.6% and 4.3%. These findings suggest that marital fertility was an important determinant of fertility during 1992–2004, whereas the proportion of married became an important determinant during 2004–2015.

Table 3. Components of Change in Total Fertility Rate (TFR) in Malawi during 1992–2015

Period	Marital Fertility	Proportion Married	Interaction
1992–2000	65.01	29.42	5.57
2000–2004	89.78	10.75	-0.53
2004–2010	2.62	77.85	19.53
2010–2015	4.25	92.58	3.17

Source: Created by the author using data from MDHSs



Source: Created by the author using data from MDHSs

Figure 4. Decomposition of Total Fertility Rate (TFR) using the United States Bureau of Census Method

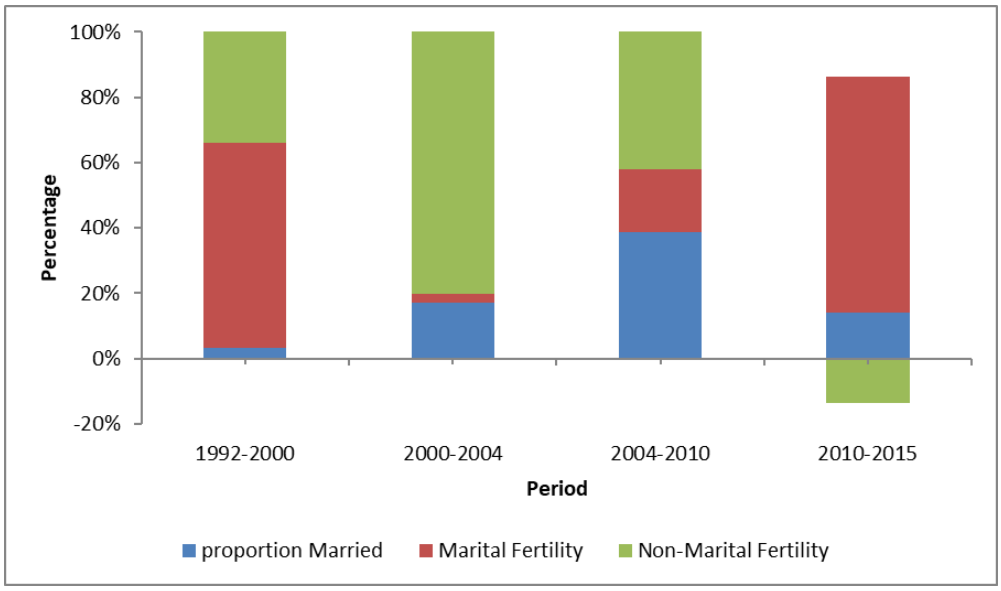
Decomposition of TFR

Table 4 and Figure 5 present the findings of the third decomposition technique employed in the study. According to Table 4, between 1992 and 2000, the drop in fertility was due to changes in marital fertility (63.2%), non-marital fertility (34.3%), and marriage patterns (3%). Between 2000 and 2004, the decrease in TFR is accredited to changes in non-marital fertility (83.3%), proportion of married (17.7%), and marital fertility (2.8%). Furthermore, changes in TFR between 2004 and 2010 are associated with changes in non-marital fertility (46.0%), proportion married (42.1%) and marital fertility (21.0%). Between 2010 and 2015, changes in marital fertility (103.2%), proportion of married (20.3%), and non-marital fertility (19.6%).

Table 4. Decomposition of Total Fertility Rate (TFR) into Marital and Non-Marital Fertility and Proportion Married, Malawi, 1992–2015

Period (years)	Proportion Married	Marital Fertility	Non-Marital Fertility
1992–2000	3.3	63.2	34.2
2000–2004	17.7	2.8	83.3
2004–2010	42.1	21.0	46.0
2010–2015	20.3	103.2	-19.6

Source: Created by the author using data from MDHSs



Source: Created by the author using data from MDHSs

Figure 5. Decomposition of Total Fertility Rate (TFR) based on Lindstrom and Woubalem Method

Determinants of Fertility in Malawi

a. Marriage

The analyses in the previous sections have shown that the changing patterns of marriage are partly responsible for the decline in fertility in Malawi. There are three issues to be considered when this claim is examined: age at first marriage, proportion married, and the amount of spent between unions.

The proportions of married women by five-year groups and the average age at first marriage for Malawi are presented in Table 5. The overall percentage of married women in the reproductive ages remained unchanged at 71% between 1992 and 2000, increased slightly to 72% between 2000 and 2004 and declined to 67% in 2010 and 65% in 2015. The changes in marriage are concentrated in the age groups younger than 35 years of age and the proportion in the age group 15–19 years records the greatest decrease. The proportion of married women in the age group 15–19 years declined by almost 55% from 0.50 in 1992 to 0.23% in 2015. Similarly, the percentage for women in age groups 20–24 years, 25–29 years, and 30–34 years were 10%, 7%, and 5% respectively. The proportion of currently married women in the age group 35–39 years remained unchanged, whereas the proportion increased for age groups 40–44 years and 45–49 years by 3% and 1% respectively.

Table 5. Proportion of Currently Married Women by Age, Malawi, 1992–2015

Age groups (years)	Years of surveys				
	1992	2000	2004	2010	2015
15–19	0.50	0.33	0.34	0.23	0.23
20–24	0.77	0.78	0.80	0.76	0.70
25–29	0.87	0.87	0.85	0.85	0.81
30–34	0.85	0.83	0.83	0.81	0.81
35–39	0.79	0.84	0.82	0.81	0.79
40–44	0.73	0.80	0.80	0.77	0.76
45–49	0.72	0.76	0.74	0.74	0.73
15–49	0.71	0.71	0.72	0.67	0.65
Age at marriage	17.7	17.9	18.0	17.8	18.3

Source: Calculated by the author using data from MDHSs

Age when women marry is one of the major determinants of fertility. It is assumed that fertility is high among women who marry at a young age. Other things being equal, early marriages are more likely to lead to women having their first child at a young age and giving birth to many children, especially in societies where the principal aim of marriage is to have children and contraceptive use is minimal. Mean age at marriage in Malawi remains low with over half of all women marrying before the age of 20 years. Table 5 indicates that average age at marriage increased slightly from 17.7 years in 1992 to 17.9 years in 2000, 18.0 years in 2004, declined to 17.8 years in 2010, and increased to 18.3 years in 2015.

b. Contraceptive use

Given that the national family planning programme in Malawi was introduced in the mid-1990's, the country has recorded a remarkable increase in use of contraception.. Table 6 show that the prevalence of contraceptive use for all the

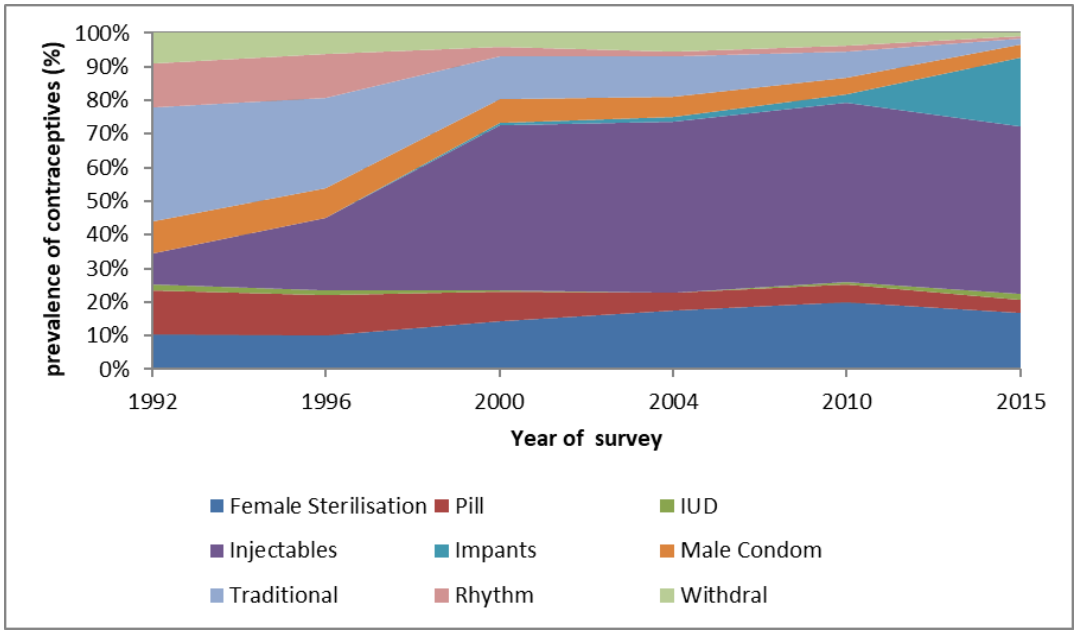
methods for was 13.0% in 1992, 24.6% in 2000, 25.5% in 2004, 45.8% in 2010, and 58.8% in 2015 (NSO and Macro, 2017, 2006, 2011, 2002, 1994). These percentages indicate that contraceptive use increased fourfold in two decades. Until recently, the increase in contraceptive use did not translate into noticeable fertility decline, but research has now linked the increased use of contraception with a decline in fertility. This observation has stunned some researchers (Palamuleni, 2013; Jain, et.al., 2014; Chintsanya, 2013).

Table 6 and Figure 6 show contraceptive prevalence by method in Malawi. The results show that there has been a change in contraception method over time. In 1992, rhythm (2.2%), pills (2.2%), female sterilization (1.7%), male condom (1.6%), injectables (1.5%) and withdraw (1.5%) were the most frequently used methods. By 1996, the use of all methods increased apart from the traditional methods. Use of injections increased from 1.5% to 4.9% during the 1992–1996 period. In 2004, injections (13.9%), female sterilization (4.8%), male condom (1.7%), pill (1.5%), and withdrawal (1.5%) were the most frequently used methods. A similar pattern is displayed in 2010. However, the commonly used contraceptive methods in 2015 were injectable, implants, and female sterilization in that order.

Table 6. Contraceptive Use by Method among Currently Married Women, Malawi, 1992–2015

Contraceptive Method	1992	1996	2000	2004	2010	2015
Female Sterilization	1.7	.2.3	3.8	4.8	9.7	10.1
Pill	2.2	2.7	2.3	1.5	2.5	2.3
Intrauterine device	0.3	0.3	0.1	0.0	0.3	1.0
Injectables	1.5	4.9	13.0	13.9	25.8	29.7
Implants	0.0	0.0	0.1	0.4	1.3	12.3
Male Condom	1.6	2.0	1.9	1.7	2.4	2.2
Traditional	5.6	6.1	3.4	3.3	3.8	1.2
Rhythm	2.2	3.0	0.7	0.4	0.8	0.3
Withdrawal	1.5	1.4	1.1	1.5	1.8	0.6
Other	2.0	1.6	1.6	1.3	1.2	0.3
Not Using	86.0	82.0	75.0	74.3	54.0	40.9
Using	13.0	18.2	24.6	25.5	45.8	58.8
Traditional	5.7	6.0	3.4	3.2	3.8	1.2
Modern	7.3	12.2	21.2	22.3	42.0	57.6

Source: Created by the author using data from MDHSs



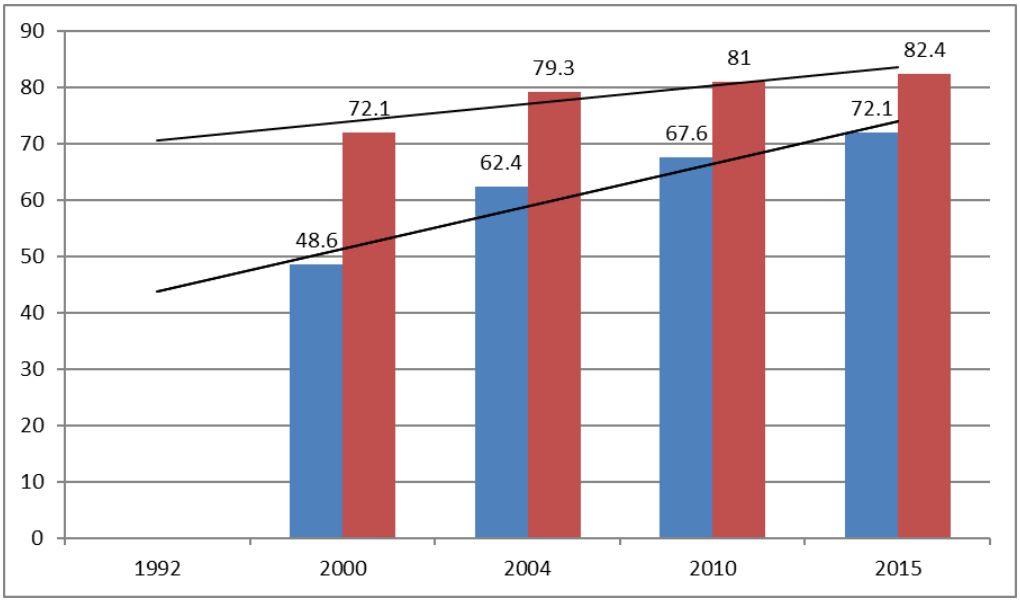
Source: Created by the author using data from MDHSs

Figure 6. Prevalence of Contraceptive Use by Method, Malawi 1992–2015

c. Education

Education is correlated with both use of family planning and fertility (Shapiro, 2012; Sibanda, et.al., 2003; Lloyd, Kaufman, and Hewett, 2000). Education, especially mother's education, is an critical factor influencing fertility (Shapiro, 2012). In general, educated women tend to have low fertility. Several hypotheses have been put forward to explain the observed negative relationship between education and fertility. Firstly, using the economic theory of fertility, it can be said that opportunity costs of bearing children among educated women are high. Secondly, according to the household bargaining model, educated women are more likely to support themselves and have more bargaining power, including on family size and contraceptive use. Thirdly, the advocates of the ideation theory argue that educated women may learn about the merit desired family size and contraceptive use through school, community, and exposure to global communication networks. Fourthly, educated women are knowledgeable about prenatal care and child health, good hygiene, and causes of morbidity and mortality. These aspects may lead to better chances that their children will survive, which may in turn lead to lower fertility. Fifthly, female education tends to delay both age at first marriage and fertility. Given the amount of time women spend schooling educated women tend to marry late and spent a few years in childbearing activities. Although the impact on fertility of female education may be the same as that of male education, studies demonstrate that the former is more important than the latter.

Figure 7 shows that the gap between male and female school enrolment rates in sub-Saharan Africa is shrinking. As such reducing the gender gap in educational enrolment and attainment may contribute to fertility decline. Available evidence from MDHS data indicates that both male and female adult literacy rates in Malawi have increased. Adult literacy rate among males increased from 72.1% in 2000 to 79.3% in 2004 and 82.4% in 2015. Similar rates for females were 48.6%, 62.4% and 72.1% respectively.



Source: Created by the author using data from MDHSs

Figure 7. Adult Literacy Rates for Male and Females, Malawi 2000– 2015

Conclusion

Using MDHS data from 1992–2015, this study scrutinizes fertility levels and trends in Malawi. Possible factors influencing the level of fertility are also discussed. Although the decline in fertility in Malawi started in the 1980s, the decline was mild until after the first decade of the new millennia. Between 2010 and 2015, Malawi witnessed a substantial decline in fertility with TFR declining from 5.6 in 2010 to 4.6 in 2015. The decline in fertility of one child per woman is a noteworthy accomplishment within five years. Standardization and decomposition methods were employed to identify the demographic factors linked with the observed fertility decline in Malawi. This exercise enabled the researcher to provide a breakdown of the changes in CBR and TFR into components such as age structure, nuptiality, and marital fertility.

The study has illustrated that the increase in CBR between 1992 and 2000 and the decrease in CBR between 2000 and 2004 was primarily due to the changes in the age structure of the population. This finding is not surprising given that one of the disadvantages of CBR as an indicator of fertility is that it is influenced by the age-sex composition of the population. During the period 2004 and 2010, the decline in CBR is influenced by the variations in marital fertility followed by the changes in the proportion of married women. Furthermore, during the period 2010–2015, the decline in CBR is influenced by nuptiality followed the decline in marital fertility. This finding reiterates that the changes in nuptiality patterns and marital fertility are important factors in influencing fertility decline in Malawi. In Malawi today, even though marriage is still early and universal, nuptiality patterns are undergoing some changes characterized by postponement of entry into marriage, increasing rate of cohabitation, divorce, and remarriage. These factors are associated with low fertility.

References

Arriaga, Eduardo E, Peter D Johnson, and Ellen Jamison. 1994. *Population analysis with microcomputers* (Bureau of the Census).

Behrman, Julia Andrea. 2015. 'Does schooling affect women's desired fertility? Evidence from Malawi, Uganda, and Ethiopia'. *Demography*, *52*, 787-809.

Blacker, John. 1994. 'Some thoughts on the evidence of fertility decline in Eastern and Southern Africa'. *Population and Development Review*, *20*, 200-05.

Caldwell, John C, and Pat Caldwell. 2002. 'Africa: the new family planning frontier'. *Studies in family planning*, *33*, 76-86.

Caldwell, John C, Israel O Orubuloye, and Pat Caldwell. 1992. 'Fertility decline in Africa: A new type of transition?' *Population and Development Review*, 211-42.

Caldwell, John, and Pat Caldwell. 1995. 'The beginning of fertility decline in sub-Saharan Africa'. *Populations du Sud*, 233.

Casterline, John B. 2017. 'Prospects for fertility decline in Africa'. *Population and Development Review*, *43*, 3-18.

Chaurasia, Alok Ranjan. 2011. 'Birth Rate trends in India: 1985-2007-A decomposition analysis'. *Journal of Family Welfare, 57*, 55-71.

Chintsanya, J. 2013. "Trends and Correlates of Contraceptive Use among Married Women in Malawi: Evidence from 2000-2010 Malawi Demographic and Health Surveys". In.: Calverton, Maryland, USA: ICF International.

Cohen, Barney. 1998. 'The emerging fertility transition in sub-Saharan Africa'. *World Development*, *26*, 1431-61.

Diamond, Ian, and Naomi Rutenberg. 1995. 'Recent trends in fertility in Botswana'. *Journal of International Development*, *7*, 145-61.

du Lou, Annabel Desgrees, Philippe Msellati, Ida Viho, and Christiane Welffens-Ekra. 2000. 'The use of induced abortion in Abidjan: a possible cause of the fertility decline?' *Population: An English Selection*, 197-214.

Gaisie, S Kwesi. 2013. 'Determinants of fertility decline in Botswana'. *African Population Studies*, 10.

Gaisie, Samuel K. 2000. 'Family structure, gender and fertility in Botswana'. *Pula: Botswana Journal of African Studies*, *14*, 130-47.

Garenne, Michel. 2013. 'Situations of fertility stall in sub-Saharan Africa'. *African Population Studies*, *23*.

———. 2018. 'Family planning and fertility decline in Africa: From 1950 to 2010', in, *Family Planning* (IntechOpen).

Garenne, Michel, and Veronique Joseph. 2002. 'The timing of the fertility transition in sub-Saharan Africa'. *World Development*, *30*, 1835-43.

Gubhaju, Bhakta, Eduard Jongstra, and Merewalesi Raikoti. 2014. 'Below-replacement fertility of ethnic Indians in Fiji: A decomposition analysis of the components of changes in the total fertility rate'. *Journal of Population Research*, *31*, 269-86.

Hill, Althea. 1986. 'The Demography of Malawi, PHN Technical Note 86-20', *Population, Health and Nutrition Department, World Bank.*

Jain, Aparna, John Ross, Erin McGinn, and Jay Gribble. 2014. 'Inconsistencies in the total fertility rate and contraceptive prevalence rate in Malawi', *Washington, DC: Futures Group, Health Policy Project*.

Jiang, Quanbao, Shucai Yang, Shuzhuo Li, and Marcus W Feldman. 2019. 'The decline in China's fertility level: A decomposition analysis'. *Journal of biosocial science*, *51*, 785-98.

John, Ben Malinga, and Vissého Adjiwanou. 2022. 'Fertility decline in sub-Saharan

Africa: Does remarriage matter?'. *Population Studies*, *76*, 213-33.

Kirk, Dudley, and Bernard Pillet. 1998. 'Fertility levels, trends, and differentials in sub-Saharan Africa in the 1980s and 1990s'. *Studies in family planning*, 1-22.

Kouaouci, Ali. 1993. 'Fertility in Algeria between 1970 and 1986: Trends and factors'. *Population an English Selection*, 21-42.

Lindstrom, David P, and Zewdu Woubalem. 2003. 'The demographic components of fertility decline in Addis Ababa, Ethiopia: A decomposition analysis'. *Genus*, 147-58.

Lloyd, Cynthia B, Carol E Kaufman, and Paul Hewett. 2000. 'The Spread of Primary Schooling in Sub-Saharan Africa: Implications for Fertility Change'. *Population and Development Review*, *26*, 483-515.

Machiyama, Kazuyo. 2010. 'A re-examination of recent fertility declines in sub-Saharan Africa', *DHS Working Papers No. 68. Calverton, Maryland, USA: ICF Macro*.

Machiyama, Kazuyo, Richard Silverwood, Andy Sloggett, and John Cleland. 2010. 'Recent Fertility Declines in Sub-Saharan Africa: Analysis of country trends of fertility decline', *36th Chaire Quetelet, Louvain la Neuve*.

May, John F, and Sara Rotenberg. 2020. 'A call for better-integrated policies to accelerate the fertility decline in sub-Saharan Africa'. *Studies in family planning*, *51*, 193-204.

MG. 1984. Malawi Population Census 1977: Analytical Report, (2 volumes), National Statistical Office, Zomba.

———. 1987a. Malawi Demographic Survey 1982, National Statistical Office, Zomba.

———. 1987b. 1984 Family Formation Survey, National Statistical Office, Zomba.

———. 1994a. Malawi Population and Housing Census 1987: Analytical Report (Volume VII), National Statistical Office, Zomba.

———. 1994b. National Population Policy, Office of the President and Cabinet, Department of Economic Planning and Development, Lilongwe.

———. 1996. Family Planning Policy and Contraceptive Guidelines, Ministry of Health and Population and National Family Welfare Council of Malawi, Lilongwe.

———. 2013. Malawi Population Census 2008: Thematic Report - Fertility, National Statistical Office, Zomba.

Mohammed, Bedrouni. 2024. "Les Sources De La Reprise De La Fécondité Chez Les Femmes Nord Africaines Cas Du Maroc, De l'Algérie, De La Tunisie Et De l'Egypte". In *9th African Population Conference (APC), 20-24 May 2024*. Lilongwe, Malawi.

NSO, MACRO, and ICF Macro. 1994. 'Malawi demographic and health survey 1992', *Zomba, Malawi and Calverton, Maryland: NSO and ORC Macro*.

———. 2002. 'Malawi demographic and health survey 2000', *Zomba, Malawi and Calverton, Maryland: NSO and ORC Macro*.

———. 2006. 'Malawi demographic and health survey 2004', *Zomba, Malawi and Calverton, Maryland: NSO and ORC Macro*.

———. 2011. 'Malawi demographic and health survey 2010', *Zomba, Malawi and Calverton, Maryland: NSO and ORC Macro*.

———. 2017. 'Malawi demographic and health survey 2015/16', *Zomba, Malawi and Calverton, Maryland: NSO and ORC Macro*.

Palamuleni, Martin E. 2011. 'Decomposition of South African crude birth rates, 1996-2001', *Southern African Journal of Demography*, *12*, 37-62.

———. 2013. 'Socio-economic and demographic factors affecting contraceptive use in Malawi'. *African*

Journal of Reproductive Health, *17*, 91-104.

Palamuleni, Martin Enock. 1993. *Population dynamics of Malawi: A re-examination of the existing demographic data* (University of London, London School of Economics (United Kingdom)).

Sayi, Takudzwa. 2014. "Relationships between fertility and marriage transitions in sub-Saharan Africa". In *Population Association of America Annual Congress*.

Schoumaker, Bruno. 2017. 'African fertility changes'. *Africa's population: In search of a demographic dividend*, 197-211.

Shapiro, David. 2012. 'Women's education and fertility transition in sub-Saharan Africa'. *Vienna Yearbook of Population Research*, 9-30.

Shapiro, David, and Tesfayi Gebreselassie. 2014. 'Marriage in sub-Saharan Africa: Trends, determinants, and consequences'. *Population research and policy review*, *33*, 229-55.

Sibanda, Amson, Zewdu Woubalem, Dennis P Hogan, and David P Lindstrom. 2003. 'The Proximate Determinants of the Decline to Below-replacement Fertility in Addis Ababa, Ethiopia'. *Studies in family planning*, *34*, 1-7.

Singh, Susheela, Akinrinola Bankole, and Jacqueline E Darroch. 2017. 'The impact of contraceptive use and abortion on fertility in sub-Saharan Africa: Estimates for 2003–2014'. *Population and Development Review*, *43*, 141.

Solo, Julie, Roy Jacobstein, and Deliwe Malema. 2005. 'Repositioning family planning—Malawi case study: Choice, not chance', *New York: The ACQUIRE Project/EngenderHealth*.

UN. 2015. World Fertility Patterns 2015 – Data Booklet Department of Economic and Social Affairs, Population Division (2015), New York (ST/ESA/ SER.A/370).

Van den Broeck, Goedele, and Miet Maertens. 2015. 'Female employment reduces fertility in rural Senegal'. *Plos One*, *10*, e0122086.

Yip, Paul Siu Fai, Mengni Chen, and Chee Hon Chan. 2015. 'A tale of two cities: A decomposition of recent fertility changes in Shanghai and Hong Kong'. *Asian Population Studies*, *11*, 278-95.